[c3]

[c4]

[c5]

[c6]

Claims

[c1] WHAT IS CLAIMED:

- 1. A method for controlling an engine have at least first and second groups of cylinders, the engine coupled to an emission control device, comprising: in response to engine starting, and during emission control device warm-up: operating the first group of cylinders at a first ignition timing; and operating the second group of cylinders at a second ignition timing more retarded than said first group.
- 2. The method recited in Claim 1 further comprising adjusting at least one of [c2] airflow or injected fuel or ignition timing at least the first group of cylinders in response to an engine control signal.
 - 3. The method recited in Claim 2 wherein said engine control signal is a desired engine speed, and said first ignition timing is retarded from a maximum torque timing.
 - 4. The method recited in Claim 2 wherein said engine control signal is a measured engine speed.
 - 5. The method recited in Claim 2 wherein said engine control signal is a desired engine torque.
 - 6. The method recited in Claim 1 wherein said operating of the first and second group of cylinders is further in response to an indication that the engine is operating in idle speed control.
- 7. The method recited in Claim 1 wherein the first group of cylinders is [c7] operated at a higher load than if both cylinder groups were operated at substantially the same ignition timing.
- [c8] 8. A method for controlling an engine have at least first and second groups of cylinders, the engine coupled to an emission control device, comprising: starting the engine by injecting fuel into both a first group of cylinders and a second group of cylinders, and operating at least one cylinder in the first group of cylinders and at least one cylinder in the second group of cylinders at an

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[c11]

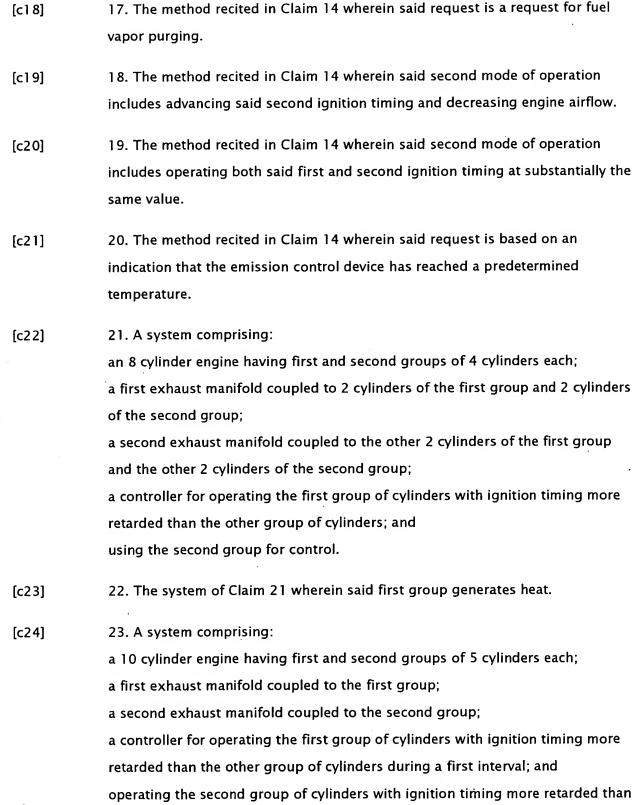
[c12]

[c13]



ignition timing near maximum torque ignition timing; after said engine starting: operating at least one cylinder in the first group of cylinders at a first ignition timing; and operating at least one cylinder in the second group of cylinders at a second ignition timing more retarded than said first group.

- [c9] 9. The method recited in Claim 8 wherein after said engine starting is determined based at least on engine speed.
- [c10] 10. The method recited in Claim 8 wherein after said engine starting is determined based at least on time since engine start.
 - 11. The method recited in Claim 8 wherein after said engine starting is determined based at least on when synchronous injection begins.
 - 12. The method recited in Claim 8 wherein after said engine starting is determined based at least on engine rotation.
 - 13. The method recited in Claim 8 wherein said first ignition timing is retarding from a maximum torque timing.
- [c14] 14. A method for controlling an engine have at least first and second groups of cylinders, the engine coupled to an emission control device, comprising: after engine starting, operating the engine in a first mode including: operating the first group of cylinders at a first ignition timing; and operating the second group of cylinders at a second ignition timing more retarded than said first group.
- [c15] in response to a request, transitioning the engine to a second mode of operation.
- [c16] 15. The method recited in Claim 14 wherein said first ignition timing is retarded from a maximum torque timing.
- [c17] 16. The method recited in Claim 14 wherein said request is a request for increased manifold vacuum.



the other group of cylinders during a second interval.